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Author(s)	Salleh Hairon
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Facilitation for Professional Learning Community Conversations in Singapore

Salleh HAIRON

National Institute of Education

Nanyang Technological University

1 Nanyang Walk, Singapore 637616.

Tel: (65) 67903248. Email: hairon.salleh@nie.edu.sg

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Abstract

Professional Learning Community (PLC) has steadily grown in importance over the last decade. The growing importance of PLCs lies in its potential to act as a lever for school-based curriculum development and innovation so as to provide diverse learning experiences to satisfy broader learning outcomes beyond academic achievements (e.g. the 21st century skills). The growth in PLCs implies greater time investment for teachers to come together to develop new curricula that engage students to meet these broadened set of learning outcomes. However, this also implies that new competencies need to be acquired to productively participate in PLCs. One essential competency is facilitating PLC conversations. This paper describes key findings drawn from participant observations with three Grade 5 PLC facilitators' involvement in an intervention to explore how PLC facilitators can support teachers' collective learning with one another on matters of teaching and learning. The findings from the study served to aid in generating a proposed intervention framework consisting of processes, principles and practices that facilitators can use in PLC conversations.

Key Words: Professional learning communities; PLC conversations; teacher leadership; teacher learning; professional development

Introduction

The current paradigm shift in teacher professional development is no longer merely on supporting the acquisition of knowledge and skills (Vescio, Ross & Adams, 2008), but on teachers playing an active role in collectively constructing knowledge on teaching and learning. This seems to have grown in importance over the last decade or so in view of educational reforms that seek to prepare students for the knowledge economy and society, and to achieve broader sets of student learning outcomes (e.g., 21st century skills) beyond academic student achievements. This is a result of the rise of the knowledge economy and society (Hargreaves, 2003). At the school level, this task is made more complex and challenging when schools are expected to satisfy increasing needs and expectations of multiple school stakeholders, namely policymakers, parents and community members. It is within this context that schools are compelled to harness the collective knowledge of teachers so as to better respond to these demands—one of which is through community-based teacher learning such as professional learning communities (PLCs) (Feiman-Nemser, 2001).

Education reformers and researchers view PLC as a means to enhance teacher learning, competency and practice leading to improvements in student learning and outcomes (Bolam et al., 2005; DuFour & Eaker, 1998; Hord & Summers, 2008; Thompson, Gregg, & Niska, 2004); Vescio et al., 2008). PLC is also perceived to hold considerable promise for capacity building of teachers – individually and collectively, which supports school-wide capacity for promoting students' learning (Mitchell & Sackney, 2000; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006). Furthermore, professional learning within a community of like-minded and empathetic colleagues can be hugely beneficial when one considers the alternative of attempting to improve teaching by coercion (Schuck, 2008), especially in situations when improvements on teaching and learning are mandated.

Although claims on PLC to improve student learning outcomes through enhancing teacher and organisational capacities remain generally non-contested, the empirical studies supporting this have yet to exceed such claims. More work is still needed in understanding the specific activities that teachers engage in PLCs within different settings (Bolam et al., 2005). Also, relatively little research had examined the specific interactions and dynamics by which professional community constitutes a resource for teacher learning and innovations in teaching practice, and how communities achieve their effects (Little, 2003). Besides the lack of empirical research base to answer the question “*What is the effect of PLCs on teacher and organisational capacities and student learning outcomes?*” much research work is equally needed to answer the question “*How PLCs affect the development of teacher and organisational capacities leading to student learning outcomes?*” Research to date has made “relatively little headway in examining the nature of the interactions by which professional community is forged, sustained, and made conducive to learning and improvement” (Horn & Little, 2010, p. 183). Stoll and Louis (2007) are therefore accurate to raise the proposition for better understanding on the collaborative processes – the learning that takes place among group members including PLCs – that lead to desirable school outcomes. This puts to the fore the importance of interactions and conversations that take place in PLCs, and hence the role of facilitation in PLCs to support the learning of group members intending to impact teachers’ teaching and students’ learning. The priority given to how PLC facilitators lead the learning of group members with the intention to impact teaching and learning is premised on the belief that teacher learning in PLCs does have significant impact on teaching and learning.

The study reported in this paper thus sought to investigate how PLC facilitators support teachers’ collective learning with one another on matters of teaching and learning in their interactions and conversations, albeit couched within the discourse of challenges. The study

employed participant observations with three PLC facilitators from mainstream public primary schools in Singapore, which lasted for three months. They were all involved in the first phase of an intervention which sought to generate a proposed framework for PLC facilitation consisting of processes, principles and practices.

This paper is separated into three main sections. The first section describes the Singapore PLC context and model. The second section discusses the importance of leadership supporting teacher conversations. The third section outlines the methodological aspects of the study comprising the design, sample, data collection, and data analysis, followed by the findings. The final section highlights key discussions pertaining to the findings leading up to the generation of a proposed PLC facilitation framework.

The Singapore PLC Model

Since the initial pilot phase of PLCs in 2009 the Singapore Ministry of Education (MOE) has encouraged every school to be a PLC school. The MOE PLC model focuses on three aims (or “Three Big Ideas”): 1) ensuring student learn; 2) building a culture of collaboration; and 3) focusing on student learning outcomes (TDD, 2010), and addresses four critical questions in PLC discussions or conversations: *What is it we expect students to learn? How will we know when they have learned? How will we respond when they do not learn? How will we respond when they already know it?* These questions were adaptations from DuFour’s questions framework (DuFour & Eaker, 1998; DuFour, DuFour, Eaker, & Many, 2010)). Schools that adopted the MOE PLC model form teacher groups called Professional Learning Teams (PLTs) with the primary role of deepening or improving pedagogy. PLTs are free to choose various learning tools such as action research and lesson study. PLTs are directed and supported by the Coalition Team comprising senior leaders (e.g., principal and vice-principal) and some middle leaders (e.g., department heads and school staff developer). The Coalition

Team's role is to provide the appropriate structures and culture supporting the overall school PLC framework. The division of labour found between PLTs and the Coalition Team within the school reflects Fullan's "Triangle of Success" – school leadership, system-ness and pedagogy (Fullan,1993). While the Coalition Teams represent the "School Leadership" providing appropriate supporting school structures and culture, PLTs represent the "Deep Pedagogy", which means the effort at deepening pedagogy. Although the Singapore PLC model conceptualises PLCs at the school level, the actual functioning of PLCs is at the group level. The overarching goals of the school approach to PLC are to improve student learning outcomes and achieve school goals.

Although the PLC experimentation is a recent development, especially the formal decision to make PLC system-wide, Hairon & Dimmock (2012) argued that the initial enactment of PLC started in 2000 with the establishment of Teachers Network Learning Circles, or "Learning Circles" for short. It uses an action research cycle involving 1) reflection, 2) plan, 3) observe, 4) reflect, and 5) critical reflection. In 2009, with the formal introduction of PLC as a whole school approach, Learning Circles became one of the learning tools proposed in the PLC framework. Singapore school teachers and leaders were therefore not unfamiliar with the principles and practices of PLCs until 2000, albeit not using the PLC term. The emphasis on PLCs in 2000 and 2009 was motivated by the spirit of teacher-led professional development in response to changing expectations to initiate curricular changes at the school level and in response to the diversification of learning outcomes whilst maintaining academic achievements. Furthermore, even though schools are required to implement various curricular reforms set by the MOE, modifications are still needed to suit the learning needs of students. It is within this context that PLC finds its potential worth in the eyes of education policymakers, school leaders and increasingly school teachers.

Leadership to Support Teacher Conversations

Although the value of conversations within the discourse of teacher learning community is intuitively apparent, how exactly conversations bring about teacher learning is not so. Senge (1990) describes *learningful conversations* as exposing people's thinking and making their thinking open to the influence of others. Conversations has been said to hold practice, pedagogy and student learning under scrutiny (Kruse, Louis & Bryk, 1995), and enable teachers to negotiate their understandings on teaching practice (Bullough & Pinnegar, 2001). Conversations also permit episodes of pedagogical reasoning, which follows a certain set of practice routines: rendering a classroom event (replay or rehearse), prompting for elaborations (question or interjection), and re-visioning of the initial account (elaboration or re-interpretation) (Horn, 2005, 2010). Conversations are moreover seen as being generative in teacher learning involving the following: (a) normalising a problem of practice (*i.e., a normal part of teachers' work and experience*), (b) further specifying the problem, (c) revising the account of the problem (*its nature and possible causes*), and (d) generalising to principles of teaching (Horn & Little, 2010). However, the interactive processes mentioned thus far are still not well researched (Beijaard, Korthagen, & Verloop, 2007; Borko, 2004; Hoekstra, Korthagen, Brekelmans, Beijaard, & Imants, 2009). Going one step further, these interactive processes could also include the notion of "knowledge building", which is understood as the production and continual improvement of ideas or value to a community using means that increase the likelihood that what the community accomplishes will be greater than the sum of individual contributions and part of broader cultural efforts (Scardamalia & Bereiter, 2003). The focus is therefore on building knowledge and not just on the kinds of learning and activities in learning communities.

While the importance of conversations in teacher learning communities has been fairly established, leadership sustaining conversations in teacher learning communities is not –

theoretically and empirically established. In their study of conversational routines, Horn and Little (2010) had observed differences in group leadership from the groups they had studied. The notion of leadership within teacher learning communities such as PLCs has been highlighted in the form of teacher leadership (e.g., Lieberman & Mace 2009; Mindich & Lieberman 2012), which can be defined as “the process by which teachers, individually or collectively, influence their colleagues, principals, and other members of school communities to improve teaching and learning practices with the aim of increased student learning and achievement” (York-Barr & Duke, 2004, pp. 287-288). It has also been claimed that the optimal function of teacher leadership is in the direct establishment of PLCs within and between schools (Harris, 2003). Teacher leadership is thus said to have the potential to enable teachers to become catalysts for change and development towards a commitment to shared collaborative learning in a community (Harris, 2005). This is because teacher leadership understandably provides the means for open communications, trust and rapport, and continuous inquiry and improvement of work (Childs-Bowen, Moller & Scrivner, 2000). Nevertheless, while due attention has been given to the importance of principal leadership in supporting PLCs (e.g., Hipp & Huffman 2010; Huffman & Jacobson 2003), the role of teacher leadership supporting PLCs tends to be neglected vis-à-vis the conversations that take place in PLCs. The neglect on teacher leadership in the conversations that take place in PLCs undergirded the interest investigating the enactment of facilitators in PLC conversations.

Method

The study drew from the ethnographic case study approach (Cresswell, 2013). The data collection and analysis were drawn mainly from participant observations of three Grade 5 PLTs each from mainstream public primary schools in Singapore over a period of three months. These schools were selected based on purposive sampling taking into consideration

the following criteria: 1) schools have allocated school-wide weekly time-tabled time for PLCs, 2) schools have groups of teachers engaging in PLCs, 3) schools have structured learning framework for teachers to engage within their respective PLCs, 4) schools have Grade 5 PLTs specialising in Mathematics, and 5) schools have interest in improving PLC facilitation, participation and engagement. Each of the three PLTs consisted of primarily Grade 5 teachers focusing on improving the teaching and learning of Grade 5 student learning outcomes in mathematics. The student population of the three schools – School A, B and C, ranged from 1,300 to 1,700. School A PLT members comprised five Grade 5 teachers – one of whom is the PLT facilitator, and one Grade 6 teacher. One of the Grade 5 teachers is a Subject Head (SH) – a formal position one cadre lower than the department head specialising in mathematics. The PLT met on average once a week or two weeks for an hour PLC conversation. School B PLT members comprised four Grade 5 teachers, two Grade 6 teachers – one of whom is the PLT facilitator, and one Mathematics Head of Department (HOD). One of the four Grade 5 teachers is a Senior Teacher (ST) – a formal position given to experienced teachers specialising in a specific subject, which in this case is Mathematics. The PLT met on average once a week or once in two weeks for an hour PLC conversation. School C PLT members comprised six Grade 5 teachers – one of whom is the PLT facilitator, and one School Staff Developer (SSD). The PLT met on average once a week or once in two weeks for a 45-minute PLC conversation.

The research team's primary role in the participation of PLTs is one of a consultant with the sole purpose of improving PLC facilitation by generating appropriate intervention processes, principles and practices for PLC facilitation. The intervention period involved three months of understanding the needs and challenges that PLT members experienced during PLC conversations and coming up with a proposed intervention framework, and five months of using the framework provided by the research team based on the observations in

the first three months. However, this study reports on the first phase of the intervention. Findings from the three-month study then provided the foundations for the development of a proposed PLC framework which was to be used for the next phase of the intervention. Observational field notes were made during and after each PLT meeting. Informal interviews with facilitators and key members of the PLT teams such as SSD and HOD were also conducted after each meeting. Most of these informal interviews were followed up by email communications summarising key observations and recommendations. Some of these formal interviews were in the form of email communications. These email communications and informal interviews had multiple purposes – 1) gain greater clarity to the research team’s observations, 2) highlight critical incidents and issues, and 3) provide recommendations for improvements on facilitation. Along the way analytic notes were made highlighting relevant themes pertaining to PLC facilitation that had surfaced from the fieldwork. In total, 23 field-notes were generated from 23 participant observations correspondingly accompanied by informal face-to-face and email communications. By the end of the first three months, the research team came up with a proposed PLC facilitation framework consisting of processes, principles and practices. In terms of data analysis, data collected from participant observations in the form of field notes was chronologically coded to identify themes specifically relating to how PLT facilitators support PLC conversations through the process of inductive analysis. Thematic codes were then progressively developed taking into consideration coherence to generate findings focusing primarily on how facilitators supported PLC conversations centring on the research question – *How do PLC facilitators support teachers’ collective learning in their PLC interactions and conversations?*

Findings

The findings from the study revealed that the PLT facilitators from the three public primary schools require specific competencies in facilitation. However, these were highlighted through the context of understanding the challenges that the PLT facilitators had experienced. In this regard, the PLT facilitators experienced difficulties in sustaining PLC conversations in three aspects: 1) encouraging group members to be part of a learning community, 2) promoting group members to learn with one another, and 3) enabling change in group members' classroom teaching practice. The following findings elaborate on these three key aspects of facilitation.

1) Facilitation: A community for collective goals

One of the first challenges that PLT facilitators faced was building a community with collective or shared goals. The three PLT groups were put together by default of their status as Primary 5 teachers. Hence, group members did not have the choice to be or not be a part of a group. Prior to the introduction of the system-wide MOE PLC initiative, group members were already practising some form of PLC such as Learning Circles, Action Research or Lesson Study for several years. Although the default mode can be seen as advantageous insofar as it provided a common context for teachers to work together, it did not maximise the idea and ideal of teacher-led professional development. However, this default arrangement was generally well accepted as it fulfilled the pragmatic needs of teachers in terms of common teaching context, and administrators in terms of common time-table.

Nevertheless, even within this common teaching context group members did not neatly share common concerns, difficulties, challenges and purposes in regard to pedagogy, instruction and student learning needs and outcomes. This was because the Primary 5 students that group members taught were grouped into classes based on ability levels. Hence, within each PLT groups, there could be two classes of High-Ability (HA) students, two

classes of Middle-Ability (MA) students, and two classes of Low-Ability (LA) students – all taught by different teachers. While teachers teaching HA students were understandably concerned with stretching students’ higher order thinking skills, teachers teaching LA students were generally concerned with helping students gain basic foundational concepts. Teachers teaching MA students faced the challenge of meeting bi-polar student learning needs – those with poor conceptual foundations and those with basic conceptual understanding but lacking accuracy in the concepts. Hence, establishing common goals and experiences among group members was a challenge to PLT facilitators.

As an illustration, School C PLT group had a teacher who was adamant in teaching in certain ways to his LA students, which two other group members did not agree to – arguing that the pedagogical approaches used were too simplistic and would not help students gain deeper and lasting understanding on the concepts to be learned by the students. The teacher’s standpoint was that her particular students were not capable to understand and memorise more complex information. She argued that she knew the students better. However, the other two group members were not convinced of this argument. Notwithstanding their differences, the facilitator was somewhat pressured to get the group work towards the adoption of a collective approach in teaching Grade 5 mathematics, which was beyond the simple teaching and learning advocated by the member teaching LA students.

The differences in the way group members approach the teaching of LA and MA students also surfaced in School A PLT group. In the initial meetings, the teacher teaching LA students shared how she believed in the “drill-and-practice” approach in teaching LA students, which two other group members did not fully support, albeit not because of its lack of effectiveness, rather the sole dependence on it. Similar to School C PLT, School A PLT group had to adopt a collective approach in teaching Grade 5 mathematics. This made the facilitation work harder too. On top of this, School A PLT group had a teacher teaching

Foundation Mathematics – that is, students who were of lower ability than LA students, and having less content coverage and lower difficulty level in the mathematics curriculum. This too had posed a challenge to building collective goals on teaching and learning. The greater challenge for facilitators thus has to do with encouraging different voices coming from different experiences to be heard, accepted, and congealed.

Another challenge to facilitation was the presence of non-Primary 5 teachers in PLT groups. This was true for School A and B. There was a Grade 6 teacher in School A PLT group, and two Grade 6 teachers in Schools B PLT group. The intention was to bring about greater diversity to the group, greater coherence between Grade 5 and 6 curricula, and greater opportunities for leadership development. The presence of non-Primary 5 group members made the facilitation task harder with respect to building collective goals. Although Grade 5 and 6 curricula are nearly similar in terms of content coverage, the Grade 6 curriculum is essentially aimed at preparing students for the Primary School Leaving Certificate (PSLE) – a high stake exam. Making the facilitation task harder, the two teachers in School B PLT group taught Grade 6 English Language when the group was tasked to look at Mathematics. Their participation in PLT discussions was more subdued and less forthcoming, especially in the early part of the year. Likewise, the Grade 6 mathematics teacher in School A PLT group largely took a back seat and predominantly played an observers' role in most of the PLT discussions. In essence, the main challenge for facilitators was to get group members to feel a part of the group with a strong sense of collective or shared goals towards improving classroom teaching and learning of Mathematics at Grade 5.

2) Facilitation: A community for collective learning

Besides the challenge to make group members develop a strong sense of community through collective goals, field work observations also revealed that the three facilitators had

difficulties in leading learning in their respective PLTs. Their only reliance was on the steps or processes inherent in action research and lesson study (or theory of action). School A and C PLT facilitators were more familiar with the action research cycle of reflection, plan, act, observe and critical reflection. Within this framework, teachers were to discuss and work together on the Area of Concern (AOC), Research Question (RQ), literature review, data collection and analysis, and report writing. The facilitation conversations were hence focused on not compromising these steps. School B PLT facilitator, on the other hand, used the 2-cycle lesson study involving lesson planning, lesson observation, post-lesson discussion, all of which acted as focal points for group discussions and milestone checks. All group members' familiarity with the learning tools of action research and lesson study was the result of these tools being introduced and used in the Singapore schools since 2000. School C PLT group however had decided not to use the action research tool to frame their PLT discussions. This was because School C school leaders did not want to burden PLT group members since the school was involved in the research study. In the three months of the study, group members received feedback from the research team to support the group learning.

Interestingly, PLT facilitators who had used the action research and lesson study learning tools did not treat them to be learning tools per se, rather as milestones for work to be monitored and completed. Furthermore, familiarity with these learning tools had side-lined the four critical questions ascribed to the MOE PLC model – *What is it we expect students to learn? How will we know when they have learned? How will we respond when they do not learn? How will we respond when they already know it?* PLT facilitators were thus more preoccupied with the steps or procedures of action research and lesson study which are more pragmatically applicable than the four critical questions, which are more generic. Moreover, PLT facilitators did not need to explicitly integrate the four critical questions with these

learning tools. This is understandable because the questions can be loosely and implicitly embedded in the action research and lesson study learning tools. In action research, the need to collectively formulate the research questions would require some form of questioning relating to what teachers expect students to learn. Likewise, the data collection and analysis would answer the question whether students have learned or not. In lesson study, teachers have to explore '*what they want students to learn*' when crafting lesson plans. The lesson observation phase allows teachers to know '*when students have learned or not learned*', and the post-lesson observation meetings, '*how they would respond if students have learned or not learned*'.

Crucially, the steps and processes of the learning tools of action research and lesson study asked a different set of conversation questions and required group members to enter into a different set of conversation practices which may or may not overlap with the four critical questions. For example, in the action research process, the set of questions that group members have to ask themselves are, in order of sequence – *What is our AOC (Area of Concern or the research problem)?, What is the literature that inform the AOC?, What is our research question and secondary question/s? What is the research design? Which research method do we want to use? What is our sample group? What instrument do we need to construct? How do we analyse the data? What are our findings? What is the conclusion and implication of our study?*

The narrative for lesson study is more optimistic in terms of its overlap with the four critical questions. The identification of an area of concern for teachers can be closely tied to the first critical question – *What is it we expect students to learn?* After this, group members spend time constructing the lesson plan to be taught by one of the group members, followed by peer observation of the lesson when group members look at how students respond to the enacted lesson plan. At this stage, group members can implicitly or explicitly ask the second

critical question – *How will we know when they have learned?* This is followed by group members discussing their observations of the lesson, which could include asking the third and fourth critical questions – *How will we respond when they do not learn? How will we respond when they already know it?*

3) Facilitation: A community for collective endeavour to change teaching practice

The third challenge that facilitators faced was enabling group members to transfer group learning to classroom teaching practice. However, the need to transfer collective learning in PLT groups cannot materialise if collective purpose and learning are not concomitantly materialised. The formation of collective purpose and learning is a precondition for the transfer of learning in PLC to teaching practice. Facilitators' unfamiliarity with the strategies to build the sense of group collective purpose and learning had thus potentially hindered the transfer of group learning to classroom teaching practice. School A PLT facilitator did not have any training in facilitating learning in groups. Based on fieldwork observations, he had difficulties in getting the views and voices of every group member to establish the group learning goals (e.g., formulating the research problem). He adopted a more laissez-faire stance in leading group conversations, albeit with a heavy reliance on following the steps of action research to guide conversations. School B PLT facilitator, likewise, did not have prior facilitation training and prior facilitation experience. She too had difficulty getting the views and voices of every group member to reach group goals. However, this task was made more difficult because she was a Grade 6 English Language teacher. Her lack of familiarity and intimacy with Grade 5 mathematics curricula, teachers and students had undermined her facilitation practices. However, the presence of the HOD Mathematics had helped in this shortcoming. School C PLT facilitator, likewise, faced difficulties in getting every group member to reach shared goals on teaching approaches. She too had no facilitation training,

had no prior facilitation experience, was new to the school, and was more comfortable with the Science curricula. She had explicitly expressed her preference in leading teacher groups pertaining to the Science curriculum. This set of circumstances had undermined not only the facilitation tasks, but also the confidence in facilitation for reaching collective goals and learning. Without these, the facilitation task of translating what is learned in groups to classroom practice was severely hampered.

The second difficulty in transferring group learning to classroom teaching practice was the deep reliance on the learning tools. The action research and lesson study learning tools and their attendant processes and steps that School A and B adopted were project-based, which required teachers to produce reports and presentations at the end of school year. This form of formalisation had instilled a certain belief in group members that their involvement in PLT discussions was to fulfil certain key performance indicators instead of on-going reflection on their day-to-day life of teaching – hence, stripping the focus on transference. This issue was surfaced through informal interviews with two experienced teachers from School A PLT group. In the case of action research, group members' attention was on completing the key milestones of research steps of action.

However, the case for lesson study is more positive because the actual 2-cycle process of planning for a lesson, delivering the lesson, observing the lesson, discussing about the lesson is more consistent with the daily work of teaching. In this respect, the transference is implicit and unintentional. However, its limitation lay in its relevance to individual group members' needs unique to his or her classroom teaching practice. As mentioned above, the students in their respective classes were grouped according to their ability. When lesson plan, delivery, observation and discussion are focused on the MA students, group members teaching HA and LA students might perceive the process as having less relevance – hence, threatening the transference. In addition, there were the perennial logistical constraints in

involving all teachers and classes to be observed throughout the school year for all the topics in the Grade 5 mathematics syllabus. Aggravating this situation was the sensitivity of having peers observing classroom teaching, especially for the less experienced teachers. As an illustration, the more experienced teachers in School B PLT group generally took the lead in being observed for teaching.

Discussion

The findings put to the fore the crucial role of facilitation in PLC conversations in supporting learning in teacher communities that seek to impact teachers' teaching and students' learning. The findings revealed that although conversations are naturally occurring phenomenon in PLCs, it cannot be left to chance in terms of effectiveness. While some PLCs can be effective in conversations to bring about the desired goals of the group, others can be less effective. The findings suggest three needs and goals for PLC facilitation – 1) building the community, 2) enhancing learning in the community, and 3) transferring learning to classroom teaching practices. The literature on PLCs has generally emphasised teacher learning (e.g., 'theory of action' by Cochran-Smith & Lytle, 2009) and its relation to teachers' teaching and students' learning, but less attention has been given to the importance of community building. Clearly, there is a lack of theorisation on the concept of community in the context of teacher learning, and further work is still required in this area (Grossman, Wineburg, & Woolworth, 2001). The study revealed that a strong community precedes teacher learning and the transference of this learning to classroom teaching practices. This is understandable bearing in mind that the main objective of PLCs is to improve student learning through collective learning, and aspects such as collegiality, bonding and trust can be considered only as soft skills – even though in reality they constitute important aspects in PLCs.

The findings had also put to the fore the indispensable role of facilitation and hence facilitators in PLC conversations. Hence, the leadership role they play in sustaining conversations to build communities of teachers learning from one another in the course of impacting teaching practices and student learning outcomes cannot be under-rated. The findings generally support the literature on teacher leadership, albeit within a PLC setting. In this regard, facilitators in PLCs are no longer playing the role of facilitation per se. The findings suggest that the degree of effectiveness of PLCs is dependent on the degree of effectiveness in the exercise of teacher leadership. The study concurs with the definition of teacher leadership as the exercise of influence of teachers on others including fellow teachers towards shared goals on improving teaching and learning (York-Barr & Duke, 2004). They do this by building a strong community through the creation of collegial norms (Harris, 2005; Muijs & Harris, 2003).

The study also suggests that teacher leadership, in the form of facilitation in PLCs, overlaps with instructional leadership with respect to developing teachers, ensuring quality teaching and learning, and aligning teaching and learning to school goals, which are generally consistent with Hallinger's (2005) conception of instructional leadership. Hallinger's (2005) conception of instructional leadership however is much broader comprising other leadership practices which may not lend themselves well to teacher leadership (e.g., framing school goals, communicating school goals, supervising and evaluating instruction). The link between teacher leadership and instructional leadership has also been well highlighted (e.g, Harris, 2005; Muijs & Harris, 2003).

Among the several dimensions of instructional leadership, promoting teacher professional learning and development is also salient in teacher leadership. The role of teacher leaders in PLC settings is not just solely on facilitating conversations, rather the intentional practices that support professional development and learning of fellow colleagues.

PLT facilitators had drawn resources from the different theories of action (e.g., lesson study, action research) (Cochran-Smith & Lytle, 2009) to enable interactive conversational processes and routines (e.g., Horn, 2010) to bring about the necessary changes to teaching practices. Closely related to the transference of group learning to teaching practices is the development of teacher knowledge in terms of curriculum content, pedagogy (*theory of teaching*), instruction (*practice of teaching, which includes giving instructions, teaching materials, learning materials, activities and environment*), assessment, and student learning (*how students learn*). This could be brought about by asking appropriate conversation questions. The four critical questions from the Singapore MOE PLC model would aid in the development of teachers' knowledge. The development of these aspects of teacher knowledge would thus seamlessly help in the transfer of learning from PLCs to classroom teaching practices. However, the connection between conversation questions and building teacher knowledge can be made more apparent and intentional.

Besides using conversational questions as a form of learning tool to aid in the transference process, another useful tool found in the findings is lesson study. The 2-cycle process of lesson planning, lesson observation and lesson discussion provides a direct link between teacher learning in PLC learning context and teaching practice context – that is, to bring PLCs into classroom teaching, and bring classroom teaching into PLCs. The potential lesson study activities to impact on teacher knowledge and instructional improvement have been highlighted before (Lewis, 2009; Lieberman, 2009). What is interesting to note from the study is that although lesson study and action research share the same principle on inquiry, lesson study may be more practical and palatable to teachers. This is understandable taking into consideration the heavy demands placed on teachers to develop the requisite skills on research (e.g., crafting research questions, literature search and review, systematic data collection and analysis) before they could even develop their knowledge on teaching. In this

regard, action research has been criticised to be a “*contradiction of terms*” when the work of teachers and researchers are juxtaposed against one another (Hammersley, 2004).

Another tool that is very useful to promote teacher learning in PLCs is the presence of the “more knowledgeable others”, and more importantly how facilitators draw out the knowledge that resides in them for group members’ benefit. This highlights the benefit of the zone of proximal development (ZPD) espoused by Vygotsky (1978) where the presence of adult guidance or in collaboration with more capable peers assist in the development of the individual learner more than if he or she does it independently of others. In a PLC group setting, the facilitator may not have the advantage of having more knowledge than others, but he or she could draw from other knowledgeable group members to aid in group members’ learning.

Finally, teacher leadership is also closely linked to distributed leadership insofar as teacher leaders have been given the power by senior or middle leaders to make decisions pertaining to the abovementioned instructional leadership tasks. Another linkage to distributed leadership is in the shared decisions that teacher leaders make together with middle and senior leaders. Although school principals or department heads empower School A, B and C PLT facilitators to make decisions pertaining to teaching and learning, they are expected to be in the know on the decisions made on instruction and curricula. In this manner, decisions on instruction made by PLT facilitators were shared with both senior and middle leaders, within certain scope or boundary (e.g., only on pedagogical and instructional matters and not curricula content). The bounded nature of empowerment in distributed leadership has been highlighted Hairon and Goh (2014). Finally, the notion of shared decisions extends also to how teacher leaders make decisions along with other teachers on instructional and curricular matters. This is consistent with the finding on the importance of

shared leadership in teacher communities by Lieberman and Wood (2002). Shared decision in distributed leadership is therefore both vertical and horizontal in nature (Harris, 2008).

Proposed Framework for PLC Facilitation

Both the findings and the ensuing discussions had helped the research team to generate a proposed facilitation framework for PLCs. The findings from the study highlight three main facilitation tasks and thus skills in order to sustain PLC conversations: 1) encouraging group members to be part of a learning community, 2) promoting group members to learn with one another, and 3) enabling change in group members' classroom teaching practice. These three aspects of PLC facilitation serve to bring about a community with collective or shared goals, followed by collective learning and finally to a collective endeavour to translate what group members have learned in PLCs to classroom teaching and learning. The research team thus proposed a PLC facilitation framework which essentially seeks to encourage or enable PLC group members to want to participate in a PLC, learn in a PLC, and change teaching practices resulting from PLC (refer to Figure 1).

The third and final stage of participation where group members are able to translate what they have learned in PLCs to classroom teaching practice not only complete the cycle of participation, but also and more crucially ensures the continual participation, commitment and hence sustainability of the community. When teachers experience the transfer of learning from PLCs to their teaching practices, they will want to participate in future community effort to change teaching practices through collective learning.

15 principles for PLC conversations

Based on the above stages of PLC participation, the research team further explored principles that PLC facilitators can draw from to enact each of the three stages. For the purpose of succinctness, the research team chose to limit to five principles of facilitation for each stage.

1) I Want to Participate

Aim: I want to be a member of the community of learners.

Question: How do we encourage teachers to want to be a member of professional learning communities?

Principle 1: Assert leadership.

Principle 2: Respect individual teacher's autonomy.

Principle 3: Protect individual teacher's well-being.

Principle 4: Promote teachers' collective identity.

Principle 5: Encourage values of inclusion.

The priority given to the assertion of leadership in PLC setting and hence influence asserted by teacher leaders is obvious (Lieberman & Mace, 2009; Mindich & Lieberman 2012). It is also based on the assumption that facilitators in PLCs, who are usually teachers, are not naturally inclined to lead other fellow teachers. As discussed above, teacher leaders' role in sustaining a strong community is significant insofar as community is a precondition for the collective learning among teachers to impact teachers' teaching and students' learning. Yet, the influence on others by PLC facilitators cannot undermine individual member' autonomy and well-being. The enactment of influence by facilitators should lead to collective identity of the group through the process of collective decision-making towards collective goals. In this way, facilitators are to actively take the views of individual voices

towards collective goals, and hence to be inclusive. The spirit of inclusion is essential as it not only recognises individual differences and strengths of group members, but also supports the synergy of individual strengths and resources.

2) I Want to Learn

Aim: I want to learn in the community of learners.

Question: How do we encourage teachers to learn in professional learning communities?

Principle 6: Conversations are to connect or be relevant to individual teachers' day-to-day classroom teaching.

Principle 7: Conversations are to create dissonance in individual teachers' current knowledge on teaching.

Principle 8: Conversations are to create explicit-differentiated knowledge from implicit-undifferentiated knowledge on teaching.

Principle 9: Conversations are to sharpen epistemological competency.

Principle 10: Conversations are to deepen curricular content, instruction, pedagogical and assessment and student learning knowledge.

The task of leading PLC group members to collectively learn is premised on the view that communities inadvertently learn from one another. The research team borrows Wenger's (1998) key idea that learning is imbedded in group members' participation in the formation and development of communities. Learning is thus a by-product of participation in PLC. The priority given to the principle on connecting conversations with individual teachers' day-to-day classroom teaching is based on the argument that a PLC should aim to improve ongoing

teachers' teaching and students' learning. PLC participation that does not contribute to the core common goal of impacting these two outcomes would most likely undermine the strength of the community. This principle should also guide the use of any theory of action tools (e.g., lesson study, action research). Beyond this principle the research team drew from the general literature on teacher learning to generate Principles 7 to 10 which have implications on the professional development role of teacher leadership in PLCs as discussed above. For Principle 7, facilitators should be able to help members see the gaps or dissonance in their current knowledge through examples, illustrations or questions, and in doing so, cause members to want to learn. This principle is underpinned by the research team's argument that cognitive inconsistency serves as an "epistemic cue for errors in one's system of beliefs" (Gawronski, 2012), which could afford positive attitude towards change and thus learning. This dissonance can be created with the presence of "more knowledgeable others" or by using appropriate questions (e.g., the four critical questions). Principle 8 draws from Schön's (1983) idea on reflective practice and double-loop learning (Argyris & Schön, 1978). Learning involved members being given opportunities to articulate their tacit knowledge on teaching, and in so doing, cause members to sharpen their knowledge on teaching. Facilitators could also help members learn by enhancing members' epistemological competency – that is, being able to know how their knowledge on teaching is derived and defended. This principle on enquiry is proposed as it has been identified to be key in enhancing teacher learning in communities (Tillema & van der Westhuizen, 2006). Lastly, the development of knowledge on teaching ought to cover knowledge on curricular content, pedagogy (theory of teaching), instruction (practice of teaching), assessment and student learning. These are intimately tied to teachers' teaching practice. Furthermore, collaborative learning has been identified to have the potential to result in the co-construction of

knowledge (Bereiter, 2002; Scardamalia & Bereiter, 2003) – including the teaching profession context (Clark, 2001; Orland-Barak, 2006).

3) I Want to Change

Aim: I want to transfer what I have learned in the community of learners to my professional practice.

Question: How do we ensure that teachers transfer the learning in professional learning communities to their daily classroom practice?

Principle 11: Make simple the complex.

Principle 12: Focus on universal pedagogical foundations.

Principle 13: Maximise coherent inter-linkages between teacher knowledge in curricular content, pedagogy, instruction, assessment and student learning.

Principle 14: Produce and reproduce teaching artifacts that can immediately be used.

Principle 15: Optimise accountability.

The principles of facilitation in the third stage centre on helping group members translate their learning from PLCs to teachers' classroom teaching. Principle 11 serves to help facilitators simplify the rich and complex discussions shared by PLCs members. This would help group members easily recall the key learning points in their applications to teaching. For Principle 12, the research team proposes that focusing on pedagogical approach or approaches that can be applied universally across content subjects, and even across grade levels, would help in the applications of what is learned in PLCs. For example, the learning drawn from discussions focusing on inquiry-based learning can be applied regardless of content subjects and grade levels. For Principle 13, the research team postulates that strengthening the inter-linkages between knowledge on curricular content, pedagogy,

instruction, assessment and student learning would help PLC group members deepen their knowledge on teaching because each aspect of teacher knowledge are inter-dependently related, and hence increase the likelihood of the knowledge acquired being put into practice. For Principle 14, the research team proposes that when teaching artifacts (e.g., a 3D model) are created or modified in PLC interactions, it would stand a better chance of being implemented in the classroom. Finally, when facilitators require group members to account how their learning translates to classroom teaching practices they inadvertently optimise accountability of members' learning in PLCs.

5 PLC Conversation Questions

In addition to the principles above, a set of five questions to guide PLC conversations were considered as part of the intervention. As discussed earlier, this is to strengthen the links between conversation questions and building teacher knowledge. The research team argues that these questions could bring about the concomitant development of five aspects of teacher knowledge stated above. However, these questions are to be used more as a guide than prescription for facilitators, and not strictly as a theory of action. In other words, the questions can be rephrased and be integrated in any segment or phase within theories of action (e.g., lesson study or action research). These questions could also be an extension, refinement or alternative to the four critical questions used in the MOE PLC Model. These questions include the following:

1. What is it we expect students to learn? (*Development of knowledge on curricular content*)
2. What is the pedagogy that helps students learn? (*Development of knowledge on pedagogy*)

3. What instructional practices help student learn? (*Development of knowledge on instruction*)
4. What assessment tools help us know if students learned or not learned? (*Development of knowledge on assessment*)
5. What is the thinking involved in students when they have learned or not learned? (*Development of knowledge on student learning*)

7 PLC Conversation Activities

Finally, to create close inter-linkage between teacher learning and teaching practice, and tight development of teaching knowledge, the research team further proposed a set of procedural steps – conversation activities – to be included in the intervention framework so as to facilitate PLC conversations. It can serve as a theory of action but is more generic than lesson study or action research insofar as it does not specifically require the specific use of procedural tools germane to action research (e.g., formulation of research question, type of data analysis) or lesson study (e.g., peer lesson observation, generation of lesson plan). This not only gives greater flexibility in how PLC group members learn with one another, but also brings about tighter linkages between learning in PLCs and teaching practices. The latter is a job-embedded feature which aids in the seamless integration with teachers' school day (Hunzicker, 2011).

1. Map out and delineate the curricular content that students are to acquire.
2. Decide on a specific universal pedagogy that seeks to enable students acquire the curricular content, and provide reasons why the specific universal pedagogy would enable effective learning to acquire the desired curricular content.

3. Select specific instructional practices – pertaining to instructions, teaching tools, learning tools, learning activities and learning environment – that enable individual students acquire appropriate curricular content, and support the chosen universal pedagogy.
4. Test out the effectiveness of specific instructional practices – *the use of a) instructions, b) teaching tools, c) learning tools, d) learning activities, and e) classroom environment* – through deductive analysis of observed student learning over time using appropriate assessment tools.
5. Generate possible explanations on the effectiveness of specific instructional practices through inductive analysis of observed student learning over time using appropriate assessment tools.
6. Sharpen specific instructional practices through –
 - Teacher demonstrations (*e.g., video recordings or live demonstration of STs, HOD, peers, or outsiders' teaching showcasing instructions, teaching and learning materials and activities*).
 - Feedback on teacher demonstrations (*e.g., given by STs, HOD and peers on instructions, teaching tools, learning tools, classroom environment, and learning activities*).
 - Teacher reflection of classroom teaching and learning (*e.g., teachers' reflective notes on instruction, teaching and learning materials, classroom environment, and learning activities*).
 - Teacher feedback on reflection of classroom teaching and learning (*e.g., given by STs, HOD and peers on instructions, teaching and learning materials, classroom environment, and learning activities*).

- Continual explicit development of teachers' understanding of instructional knowledge.

7. Deepen pedagogical knowledge by –

- Re-visiting key features of the pedagogy.
- Making additions to key features of the pedagogy.
- Making amendments to key features of the pedagogy.

The above seven conversation activities can be covered over several PLC meetings, and do not need to be carried out in a linear way where one activity must be followed one after another in a strict manner. The underlying supposition of the seven activities is progression in the development of teacher knowledge and its corresponding application in teaching practice.

Conclusion

The findings drawn from the study has put to the fore the crucial role of conversations in PLCs and facilitation in PLC conversations to bring about collegial, collaborative and learning relationships in the course of impacting teachers' teaching and students' learning. The findings revealed that although conversations are naturally occurring phenomenon in PLCs, it cannot be left to chance. The study had also provided the means by which the research team could contribute to furthering the knowledge base on PLC facilitation specifically in the establishment of the three stages of PLC participation, 15 principles to guide group members in these stages of PLC participation, five conversation questions, and seven activities in PLC conversations. This forms the proposed PLC facilitation framework which can be used for the development of PLC facilitators – the penultimate aim of which is to not only support the development and maintenance of PLCs, but also ensure that the

learning that takes place in PLCs are translated to classroom teaching practices, and thus ensuring the sustainability of PLCs.

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Figure 1: 3 Stages of PLC Participation